



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/642,210

08/18/2003

Tatsuro Ide

1021.43051X00

2231

20457

7590

12/11/2006

ANTONELLI, TERRY, STOUT & KRAUS, LLP  
1300 NORTH SEVENTEENTH STREET  
SUITE 1800  
ARLINGTON, VA 22209-3873

EXAMINER

CHU, KIM KWOK

ART UNIT

PAPER NUMBER

2627

DATE MAILED: 12/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/642,210	<b>Applicant(s)</b> IDE ET AL.	
	<b>Examiner</b> Kim-Kwok CHU	<b>Art Unit</b> 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/18/2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                      |                                                                                        |
|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                          | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                 | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____                                                |

***Specification***

1. The disclosure is objected to because of the following informalities:

(a) in the section of Brief Description of the Drawings, the term "Fig. 1" should be changed to --Figs. 1(a) to 1(d)--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless --  
(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.*

3. Claims 1-17 are rejected under 35 U.S.C. § 102(e) as being anticipated by Maruyama (U.S. Patent 6,760,295).

4. Maruyama teaches an optical head having all of the elements and means as recited in claims 1-15. For example, Maruyama teaches the following:

(a) with respect to Claim 1, a first light source 12 for generating light with a first wavelength  $\lambda_2$  (Fig. 1; CD light module; column 4, lines 55); a second light source 11 for

generating light with a second wavelength  $\lambda_1$  that is shorter than the first wavelength  $\lambda_2$  (Fig. 1; DVD module; column 4, line 54); an objective lens 21 for converging the light from the first light source 12 and the light from the second light source 11 (Fig. 1); and a phase grating 22 disposed between the objective lens 21 and the first or second light source for increasing or decreasing the size of the beam of light of at least one of the first and second wavelengths (Fig. 1, objective lens changes a light beam's size); the phase grating 22 having a groove with a depth  $d$  (Fig. 3A; column 6, lines 6-18), wherein the phase grating satisfies  $(n_2 - n_1)d > \lambda_1$  where  $n_2$  is the refractive index of the phase grating and  $n_1$  is the refractive index of the areas around the phase grating 22 (Fig. 1; Tables 1 and 3;  $d$  always larger than  $\lambda_1 / (n_2 - n_1)$  where both refractive indexes are not specified).

(b) with respect to Claim 2, the prior art of Maruyama further teaches that the phase grating 22 increases or decreases the size of the beam of light from at least one of the first and second light sources in shorter-axis and longer-axis directions with different magnifications (Fig. 1; grating 22 is a phase change grating means which change a light beams' shape).

(c) with respect to Claim 3, the prior art of Maruyama further teaches that the phase grating satisfies:  $(n + \theta^1 / 2\pi) \lambda_1$

$= (m + \theta^2/2\pi) \lambda_2$  where  $n$  and  $m$  are integers,  $\theta^1$  is a phase difference provided to the first wavelength, and  $\theta^2$  is a phase difference provided to the second wavelength (Fig. 1; Tables 1 and 3; the phase grating always satisfies the equation where both refractive indexes and integers  $n$ ,  $m$  are not defined).

(d) with respect to Claim 4, the prior art of Maruyama further teaches that the phase grating 22 comprises a substrate having a step- or sawtooth-shaped blazed grating 232 formed on both sides thereof (Fig. 3A and 3B; the grating means has two sides formed as steps).

(e) with respect to Claim 5, the prior art of Maruyama further teaches that the diffraction light produced by the blazed grating, a zero-order or first-order diffraction light is used (Fig. 1; inherent feature where a diffracted light beam is being focused by the objective lens).

(f) with respect to Claim 6, the prior art of Maruyama further teaches that the phase grating 22 comprises a first grating 232 for increasing the size of the beam of at least one of the first and second wavelengths, and a second grating 232 for reducing the size of the thus increased size of the beam (Fig. 4; the size or efficiency of the beam is changed).

(g) with respect to Claim 7, the prior art of Maruyama further teaches that the phase grating 232 comprises a first grating for reducing the size of the beam of at least one of

the first and second wavelengths, and a second grating for increasing the thus reduced size of the beam (Figs. 3A and 4; the size or efficiency of the beam is changed).

(h) with respect to Claim 8, the prior art of Maruyama further teaches that the phase grating 22 does not change the size of the beam of the first wavelength (Fig. 1; column 8, lines 38-39).

(i) with respect to Claim 9, the prior art of Maruyama further teaches that the phase grating 22 does not change the size of the beam of the second wavelength (Fig. 1; variation design of the grating pattern).

(j) with respect to Claim 10, the prior art of Maruyama further teaches that the phase grating 23 reduces the size of the beams of both the first and second wavelength (Fig. 1; variation design of the grating pattern).

(k) with respect to Claim 11, the prior art of Maruyama further teach that the phase grating 22 reduces the size of the light of the first wavelength while increasing the size of the light of the second wavelength (Fig. 1; variation design of the grating pattern).

(l) with respect to Claim 12, the prior art of Maruyama further teach that the first wavelength is about 780 nm and the second wavelength is about 650 nm (Fig. 1; CD and DVD laser sources are used).

(m) with respect to Claim 13, the prior art of Maruyama further teach that the phase grating 22 is disposed in the optical path of divergent light (Fig. 1; laser sources emit divergent light beams).

(n) with respect to Claim 14, the prior art of Maruyama further teach that the phase grating 22 is disposed in the optical path of collimated light (Fig. 1; collimator 14 is in the optical path).

(o) with respect to Claim 15, the prior art of Maruyama further teach that the optical head is a recording head for recording information on a recording medium using the light of the first and second wavelengths (Fig. 1).

5. Claims 16 and 17 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claims 16 and 17 however also recite the following limitations that are also taught by the prior art of Maruyama:

(a) a module including the first and second light sources (Figs. 5A and 5B), and the phase grating 22 is integrally formed with the module (Fig. 1; grating means and the light source module are integrally formed as an optical head).

***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sakai (6,873,591) is pertinent because Sakai teaches a phase change grating means used in an optical head.

Arieli et al. (6,707,608) is pertinent because Arieli teaches a diffractive grating means used in an optical head.

Nishiyama (6,580,674) is pertinent because Nishiyama teaches a phase change grating means used in an optical head.

Katsuma (6,545,821) is pertinent because Katsuma teaches a phase change grating means used in an optical head.

Ohtaki et al. (6,449,095) is pertinent because Ohtaki teaches a phase change grating means used in an optical head.

Ishii (6,157,488) is pertinent because Ishii teaches a phase change grating means.



7. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Kim CHU whose telephone number is (571) 272-7585 between 9:30 am to 6:00 pm, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea Wellington, can be reached on (571) 272-4483.

The fax number for the organization where this application or proceeding is assigned is (571) 273-8300

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9191 (toll free).

Kim-Kwok CHU

Examiner AU2627

December 5, 2006

(571) 272-7585

  
ANDREA WELLINGTON  
SUPERVISORY PATENT EXAMINER